User's Manual

Car amplifier Audison Thesis HV Venti two-channel

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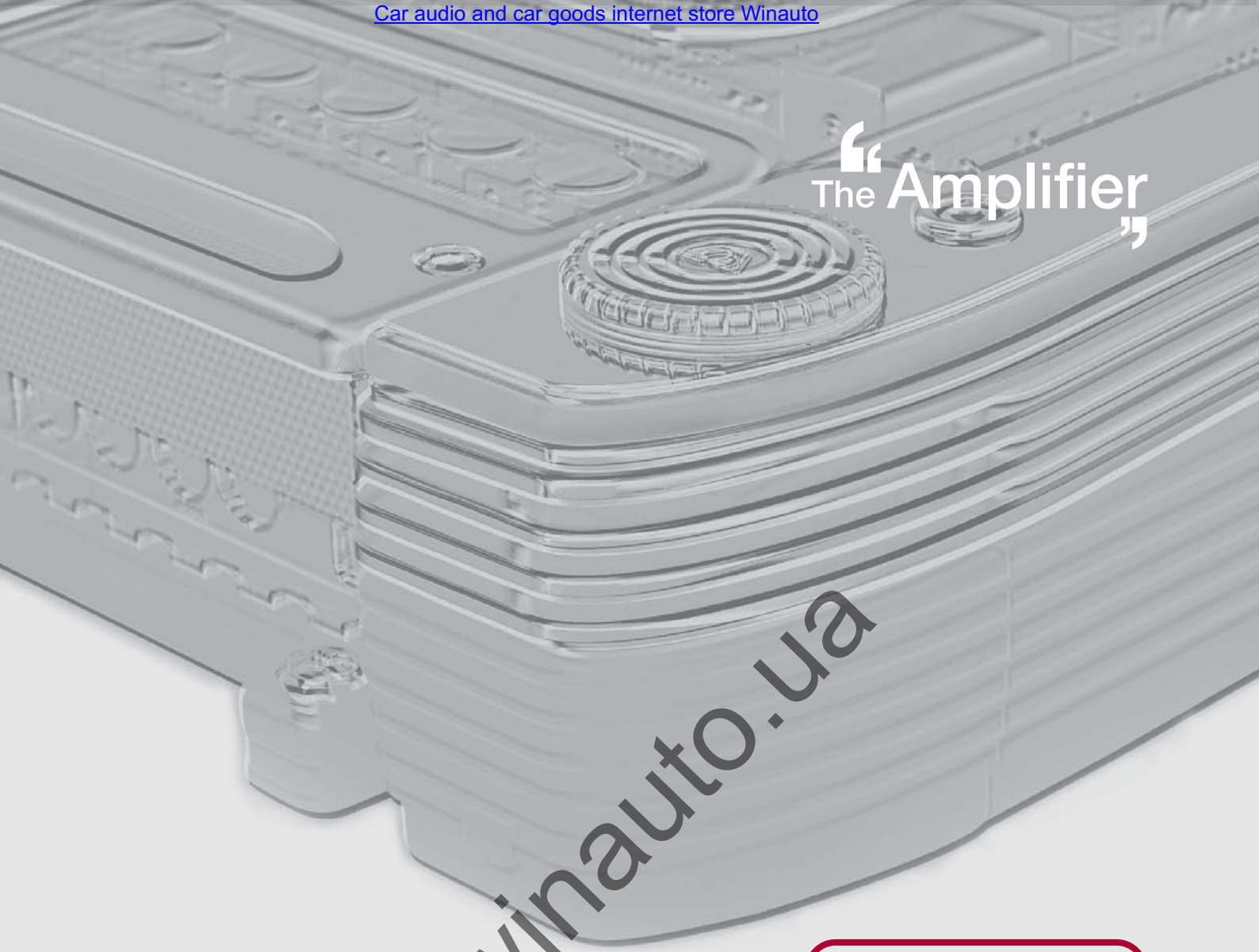

"The Amplifier"

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THESIS

HV venti

Car Power Amplifier

Owner's manual

Technology and Art of Sound
Manufactured by elettromedia Italy

audison

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Safety precautions

• The vehicle electric system must have 12VDC voltage with negative to ground. Make sure your car has it in order to avoid any damages to your amplifier and to the car itself.
• Suitably fix the amplifier paying utmost attention if you install it into the driver's compartment. Use extra fixing systems if you install it inside the bonnet. If the amplifier detaches itself while you are driving, it can severely damage people and other vehicles.
• Power supply cable must have mechanically resistant and self-extinguishing insulation. Its section has to comply with what is indicated in this manual. When placing it, avoid to press it against cutting parts or close to mechanical moving objects. Make sure it is suitably fixed all along its length. Block positive and negative cables just close to the amplifier respective power supply terminal blocks through a clamping screw.
• Put a fuse holder close to the battery positive terminal; connect one end of the power supply cable to it after connecting its other end to the amplifier. The fuse value must be 50% higher than the amplifier built-in one. In case the cable supplies several amplifiers, the fuse value will have to be 50% higher than the sum of the values of all other fuses in the system.
• For safer driving, we recommend to adjust volume not to drown external traffic sounds.
• **WARNING.** When the amplifier works in particularly hard conditions, it can reach 90°C (194°F). Make sure its temperature is safe before touching it.

Functioning precautions

• Install the amplifier in locations where temperature is between 0°C (32°F) and 55°C (131°F).
• There must be suitable air circulation where you install the amplifier; this area must not be affected by humidity, rain, external deposits or parts coming from the vehicle mechanical devices. Let the amplifier glass upper part (i.e. the part where air goes in and out) be at least 10 cm (4") far from possible walls.
• When installing speakers and the cables that connect them, make sure that non-insulated parts never touch the car cutting parts. If they do, the amplifier protection intervenes.
• Listening level calibration is made by adjusting the source volume up to 3/4 of its maximum level; then, adjust the amplifier levels until you can hear distortion and you can see PEAK indicators are occasionally on.
• Avoid to start the car engine with the amplifier on. If the battery isn't sufficiently charged, in case you start the car with the audio system on, the amplifier could go in the protection mode.
In this case isn't sufficient to shut off the audio system and turn it on after some seconds.

Maintenance and reliability precautions

• Periodically clean the amplifier avoiding to use aggressive solvents that might damage it. Dampen a piece of cloth with water and soap, wring it and clean the amplifier with it. Then, clean the amplifier by using a piece of cloth dampened with water only; eventually clean it with a dry piece of cloth.
• Remove dust and solid deposits from the five upper grilles through which air goes in and out. This must be periodically done by removing the magnetic fixing grilles and by cleaning the filter you can find underneath them as indicated in this manual. Avoid to use compressed air on the grilles without removing them, since it would push solid parts into the amplifier. If necessary, please contact a specialised service centre for internal cleaning. Air ducts obstruction makes the amplifier go in safety.

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1 • PROJECT PURPOSE

Audison has always pursued the best audio reproduction in all of its products.

The creation of the HR100 in 1991 occurred simultaneously with the achievement of a technological goal. On one hand it appeared to use all the knowledge attained to this date, yet on the other hand it set a landmark for years to come.

Universally recognized as “The Amplifier”, the HR100, unlike other car stereo products, set a new standard for “longevity; being produced until year 2003. It identified the Audison brand throughout the world. The worldwide press awarded it many accolades countless number of times, and today it stays a reference product for its performance. To car audio fans worldwide it stands as a legend.

Throughout the HR100 project, Audisons’ mission was to obtain the highest sound quality without compromises. Its maximum power output was its only limitation, as technology of the time did not allow this reference sound quality with massive power.

Four years later the THESIS brand was created. Using the latest in technology, Audison once again rewrote the book on amplifier performance. In 1995 and in 1996 respectively, HVsedici and HVtrenta amplifiers came to light.

After the introduction of these amplifiers, new standards were set as far as the sound quality / power quotient were concerned. They were also the first to use balanced inputs in a rational way through the worldwide-patented ABS (Audison Balanced Systems) connectors. HVsedici and HVtrenta became another legend

THESIS line amplifiers became the most requested products by car audio enthusiasts looking for dynamics and necessary to anyone in the competition circles requiring maximum SPL without sacrificing sound quality

Each of the two projects, THESIS and HR100, keeps its own identity and sonic footprint, which is difficult to surpass. Therefore a new version of these classics may have changed their look, maybe also some of their features, but not their sound specifications.

However there was still a way for Audison to try to improve, by merging these two unique characters into one amplifier. This has been the idea of Audison engineers for a very long time.

After several years, obtaining a deeper technological knowledge, this became possible. The project of a new THESIS amplifier was launched. After two years of research, by exploiting the technical know-how that has been gathered in the course of time and by employing the best, most recently introduced electronic components available, today THESIS HVventi is born.

With HVventi, Audison aims at renewing the HR100 and THESIS legend status. Internally the most current available technology was employed; therefore it is not dangerous to predict that HVventi is going to remain an absolute reference product for many years to come.

It could only be overcome when a further technological leap occurs, mostly concerning components. When that technology is available, Audison will continue to be the legend.

2 • PROJECT PHILOSOPHY

From the start, the vision of the HV venti project was characterised by absolutely no compromises in achieving maximum performance. Each stage of the amplifier was designed employing the most suitable components even if they were hard to find.

The first unique aspect of the project is the total void of integrated operational circuitry. Due to their constructive technology and the low voltage level that the circuitry can handle, they can deteriorate the signal.

Their elimination permitted the engineers to work at higher voltages and with a Class A biasing of the intermediate stages; the choice of working in Class A caused the associated heat on the circuits, which might have led to the components destruction.

Achieving proper operating temperature was a key design component. Cooling all the internal heat sources through a complex thermal transfer system that directs heat into the main heat sinks assertively attacked the thermal issue. Employing five controlled fans solved the problem of temperature variation, which affects circuit stability, sonic consistency and also lowers reliability.

Signal commutations were treated using special relays: too complex of a circuit would have led to longer tracks and parasitic inductances, causing signal deterioration and loss of musical information.

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The final power stage uses an innovative topology, which aims at increasing Class “A” polarization as much as possible.

The whole input circuit is balanced up to the final stage “Front End”, while the amplifier’s configuration is “Dual Mono”.

In order to avoid electro-magnetic interferences, no high current is passed on the main board, with the exception of power supply terminals; this solution was achieved through the use of a second board that is located under the main board. This second board is used to carry the large power supply current to the final stage.

As in the VRx series, the PWM Sincro configuration was employed in the power supply stage. It was chosen due to its response time; obviously, since the configuration is Dual Mono, four power supplies were employed.

Two more power supplies are used in the signal stage, one for each channel, realised in a high efficiency configuration.

An innovative function called “Dual Power “ was introduced which can predict the amplifier’s output power by choosing between two distinguished configurations called Hi Current and Hi Power.

In the Hi Current configuration the amplifier delivers 200W at 4 ohm and can also be used at 2 and at 1 ohm; this configuration is recommended when you want the amplifier to work with really difficult loads.

In the Hi Power configuration the amplifier delivers 400W at 4 ohm and it can also be used at 2 ohms; Hi Power configuration is recommended for 4-ohm loads.

Obviously, the amplifier easily drives minimum loads equal to 1 ohm in Hi Current configuration and to 2 ohms in Hi Power configuration, but remember, there will necessarily be a slight drop in terms of sound quality.

In order to switch the configuration, you have to remove the amplifier’s cover and place four minifuses into the special slots. This operation can only be made when the amplifier is off both for technical reasons and for obviously safety reasons, since inside the HV venti there are voltages over 150V!

You also have to remove the cover in order to insert the crossover module, which is provided as factory option.

In order to manage these unique features, a control unit called ASC (Amplifier Status Controller) was specially designed. A separate microprocessor controls this function.

Installing the amplifier was a very important design concern due to the significant weight of the HV venti. In order to install it, you must first found a solid position to install the bottom mount plate. The amplifier then mounts to this plate.

Finally we accurately looked after aesthetics, taking functionality into account as well.

In order to satisfy the cosmetic expectations of the potential HV venti owner, the amplifier was equipped with a special tempered glass cover and internally lit using white coloured LEDs, recently introduced into the market.

The internal light and ASC display can be turned on in demo mode for demonstration purposes through an external 12 V power supply.

Exuding more exquisite fit and finish, and to make its aesthetics very long lasting, all materials used were treated with galvanic methods, eliminating painted finishes.

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3 • ELECTRONICS

a) Preamplifier

It is made of two groups, Front End pre-amplifier and control unit.
The whole stage is balanced up to the driver outputs.
90 V separate the power supply voltage.
The pre-amplifier can be bypassed with the PRE ON/ PRE OFF switch. If the pre-amplifier is bypassed (PRE OFF), the whole pre-amplification unit is disabled and, as a consequence, also some controls are bypassed, except for IN MODE and OUT MODE. In this case however you can still insert the factory provided electronic crossover. Of course by bypassing the internal pre-amplifier, you will have to use an external pre-amplifier and it will have to be placed near the musical signal source. In order to exploit the plus points of an external pre-amplifier, you will have to carefully choose a device with higher quality than the one factory provided and to use very high quality cables for the connections.

Front End:

ABS balanced inputs with balanced bypass outputs (available in both PRE ON and PRE OFF configurations).
Decoupled input stage through two polypropylene capacitors in each channel (available in both PRE ON and PRE OFF configurations).

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2 INTRODUCTION DESCRIPTION

JFET differential input stage (available in PRE ON configuration).
Selectable two level input gain structure adjusted (available in PRE ON configuration).
Balanced output buffer for control unit (available in PRE ON configuration).
Thermally stabilized (available in PRE ON configuration).

Control Unit:
Allows the amplifier to be properly configured and adjusted.
- Sensitivity.
Adjusted using the IN SET switch and ADJUST control.
IN SET allows you to adjust the amplifier's sensitivity in 2 levels by changing the pre-amplifier's gain.
The first level is used for input gain from 1÷6 V (0 dB Gain), while the second is used for input gain from 0.25÷1.5 V (13 dB Gain).
The ADJUST control allows adjustment within the indicated values.
- L/R alignment.
Used to increase L or R channels level up to +3dB.
This is useful to balance the output of the two channels.
- IN Mode.
Used to select balanced or unbalanced input mode.
- Out Mode.
It allows the amplifier to operate in stereo or mono configuration (R input).
Unlike what occurs with all amplifiers that have one channel out of phase channel, the HV venti has in phase channels for perfect symmetry.
Pressing the Out Mode control to configure the amplifier in mono, a phase inversion is activated.
When using in the mono mode, the loudspeaker has to be connected to the positive lead of each terminal. In the mono mode, if the optional crossover module is installed, the Lo Pass 24 dB configuration is automatically activated.
When control unit is bypassed (PRE switch on OFF), IN MODE and OUT MODE are the only enabled switches.

b) Crossover
Factory optional module.
In order to insert the module, you have to remove a small bypass module. The crossover module itself contains all the electronics needed to allow proper adjustment.
The crossover was designed in this way so that, in case of passive systems or the use of external processors, there would be no extra components for the signal to pass through, degrading the signal.
Available adjustments are Hi Pass /Lo Pass 12 dB and Lo Pass 24 dB mono.
Four cut-off frequencies are selectable for the filter (45; 55; 65; 80 Hz). Adjustment can be made by removing and rotating a small module that is on the crossover.
Although this solution is limiting compared to a continuously adjustable cut-off, filter linearity is drastically improved and long signal paths are avoided.
You can install the crossover module both in the PRE ON and the PRE OFF configuration.

c) Driver
150 V separate power supply.
Thermally stabilized.
Class A biasing.
Balanced input (available in both PRE ON and PRE OFF configurations).
First stage, complementary JFET differential.
Second stage, complementary BJT differential.
Cascode voltage amplifier.
Output buffer to drive output stage.

d) Output power stage
The output power stage is based on an innovative topology similar to IGBT (Insulated Gate Bipolar Transistor) but employing discrete devices.
The circuit is made from a complementary pair of Hitachi DMOS drivers, usually used as output stage devices (such as in HR100), which drive two pairs of SANKEN power BJT transistors providing each with 30 A peak current capability and 200 W dissipation.
This solution allowed the use of only two pairs of output devices, thus permitting bias currents to be reduced which necessarily have to be shared according to the number of output devices in parallel; therefore increasing the bias current

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value on every output device is possible, keeping stable the total current absorbed by the amplifier when in idling status. All this results in the increase of the output stage to class A value.
This value is the typical car audio amplifiers' weak point. Due to installation needs, they always require several output devices in parallel in order to work on very low loads and in the meantime to have low consumption since the car battery supplies them.
This configuration proved to be especially valid both in terms of power performance and of acoustic quality: the DMOS power transistors used as driver supplies the current that the BJT output needs because their "current gain" decreases when current increases. Thanks to the DMOS voltage amplifiers' specific feature, the configuration used insures that this gain decrease doesn't overload in current the previous voltage amplifier stage and it can have a constant distorsion for every output load.

Also regarding the output power stage, an innovative solution was adopted.
In any amplifier high supply currents, power output and return ground current create electro-magnetic fields interfering with our precious audio signal.
In order to avoid this kind of situation, you are often forced to use convoluted wiring which compel designers to accept compromises. Compromise is not accepted in the HV venti.
Inside the HV venti a six layer thick copper board was used which gathers all the output stage return currents; the layout was created so that each current path comes to close contact with the return current flowing backwards.
This way the electro-magnetic fields are out of phase and nullify each other: this solution could be defined as a "balanced power supply".

e) Power supplies
There are two Hi power supplies for each channel. They supply power exclusively to the output stage.
Each power supply pair of each channel works in Synchro- PMW mode: an independent circuit controls each of them. However, they are synchronized with one another and are designed to supply one single power source, one supplies the positive and the other the negative power.
This solution, which has been employed by Audison for a very long time, allows engineers to increase the impulsive current transient response necessary to the amplifier.
In HV venti this configuration was doubled in each of the two channels: the amplifier is actually set into a Dual Mono configuration, reducing interference between the channels.
Furthermore, the two pairs of power supplies were synchronized to reduce radio frequency electro-magnetic interference.
The use of 4 separate power supplies has a further advantage.
Power split allowed the use of just one MOSFET, although a large power one, for each rail of each power supply, thus avoiding the paralleled configuration that is perhaps the main cause of amplifiers failures.
Each transformer and relative filter inductor were enclosed in non-magnetic metallic shells and then filled with resin.
This procedure further increases reliability for two reasons: first of all, coils are blocked and therefore made immune to vibrations; secondly, heat is homogeneously distributed, thus preventing any possible overheated areas.
The resin-filled groups were then mounted onto the aluminium thick bottom plate to allow heat to be dissipated through side heatsinks.
In the Dual Power function, each transformer was equipped with two secondary windings that are selectable by positioning minifuses into the two available jumpers. For Hi Current configuration you need 15A fuses, while for Hi Power configuration you need 10A fuses; the fuses are factory provided.
All the necessary adjustments for Dual Power configuration are automatically managed by the ASC (Amplifier Status Controller) .
All the rest of the power needed for signal circuits are supplied by two Flayback power supplies, one for each channel. They have reduced power but are high efficiency types and are synchronized with the main power supplies. The whole power supply group is connected to the car battery through two supply terminals equipped with a strip fuse. Two further terminals are provided to connect an external capacitor.

f) ASC: Amplifier Status Controller
The ASC unit (Amplifier Status Controller) is in charge of managing all of the amplifier's configuration functions.
It is equipped with its own proprietary microprocessor. Using the Status Display, you can visualize operational functions or any possible anomalies of the amplifier or of the external systems. The ASC also handles the protection circuits and checks thermal conditions of each component and maximizes the fans to keep things under control. Vumeters are used to identify output power.

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Indications shown on the Status Monitor are:

POWER ON: The amplifier turn on status.
HI POWER: When on Dual Power is in Hi Power mode, if turned off it means it is in Hi Current mode.
In the case of wrong fuse positioning, master protection activates.
FAN ON: Cooling system is active.
TEMP GOOD: If solidly illuminated, it indicates the best operating temperature for maximum listening pleasure; if it blinks, please wait.
LEFT CH: If it blinks intermittently, the left fan is active. Intermittence can vary depending on the three levels of fan speed. If it doesn't blink, it means that left channel has gone in protection mode.
RIGHT CH: Same operation as left channel.
BATT PRT: Protection activated because battery voltage is lower than 11 V or higher than 16 V.
THERM PRT: Thermal protection is on at 90°C (194° F) .
CHECK SPK: One output is in short circuit state with the car chassis. Check loudspeakers and cables.
SAFETY PRT: A certain protection is on. Check the other leds to identify the cause.
CHECK FAN: One of the four side heatsink fans or the drivers central fan is not functional. Check fans and air pathways.
SERVICE: The amplifier is faulty, please go to the nearest after sales service centre.
LEFT (VUmeter): It indicates the signal level on Left output.
RIGHT (VUmeter): it indicates the signal level on Right output.
PEAK (VUmeter L/R): It reveals the amplifier's distortion limit. It usually turns on when the VUmeter is fully on, indicating Clipping mode. It may occasionally turn on, but if on solid, power needs to be reduced. If it turns on when VUmeter isn't fully on, there must be anomalous distortion. Possibly the applied load is too high (low impedance) or has anomalies.

g) Lighting system
For cosmetic effect, the HV venti is equipped with three styles of lighting: the Thesis logo and glass perimeter red, the Audison logo blue, and the internals of the amplifier are lit white.
If the user removes the glass top plate, there are no electric wires to disconnect or reconnect, as electric contact automatically occurs through spring loaded contacts; the white light for the internals are the result of various white coloured LEDs.
In order to avoid current consumption, near the battery terminal connections on the amplifier, there is a LIGHT ON-GND terminal. If you connect this terminal to the car chassis, all the internal lights turn on. You can also control the internal lights remotely through a switch. You could also connect the terminal to the trunk light ground switch so when the trunk is opened the amplifier lighting comes on.
Near this connection, there is a DC terminal to connect a small external 600 mA, 12 V power supply to turn on all the internal lights, including the Status Controller. In this case the ACS activates in the demo mode. This function is useful for exhibitions and doesn't require the LIGHT ON-GND terminal to be connected to the car chassis.

4 • CHASSIS AND THERMAL PROJECT

The HV venti was designed to dissipate the heat generated by the amplifier, and to make the system thermally stable.
Generally speaking, the system consists of a 5 mm thick aluminium plate that connects to two side cooling ducts; on the top of the amplifier two fans are placed at the end of each side. One pulls the air in, the other pushes it out, thus creating a flow inside the underlying tunnel.
The aluminium plate bears all the various internal parts and also acts as heat-gathering element: internal heat generating parts such as transformers and the energy management modules are attached to this plate.
This solution not only helped to eliminate the high heat generated by the HV venti internal circuits class "A" biasing, but it also allowed excellent circuitry layout, by not forcing the designers to place the biggest heat sources next to side heatsinks.
As well, as explained in the previous section, all power wiring runs on a board underlying the main one and is electrically connected to it through screws and soldered bushes; this two layer thick copper power board is in touch with but electrically insulated from the bottom plate: as a result, the whole power layout exhausts heat through the side ducts.
We turned to a different solution for the drivers and preamplifier section.
The side ducts prevent the temperature from overcoming certain values but are nevertheless affected by the environmental temperature and the time needed to reach the best working temperature. Instead, the drivers and preamplifier circuitry needs constant temperature.
In order to solve the concern, a further small tunnel for the central cooling system was designed. This tunnel is internally combined with a fifth autonomous fan.

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Drivers were attached to it, while the preamplifier is connected to it through copper bars.
The fan is managed by the ASC unit, permitting it to quickly reach the optimal temperature and stabilize it.
The air pulled in by the fan is discharged between the main board and aluminium bottom plate, then it goes out through the input and power terminal sides of the amplifier.
Since this air isn't extremely hot, due to small power dissipation, it helps to eliminate the possible stagnated hot air under the main board mosfets.
The side ducts where both power supply and output power stage transistors are placed, including emitter resistors, are coupled to it by fixing springs, and were purposefully sized to dissipate heat.
This system allows the air to go out through the amplifier top, thus avoiding the fact that, when the amplifier is embedded into an into a custom installation, a closed area of hot stagnated air is generated underneath the amplifier which would prevent the cooling system from pulling cool air in and would make the system inefficient.
Using finned aluminium heatsinks, the ducts also employ a natural convection cooling system.
This way, if the forced cooling system loses efficiency, heat dissipation doesn't fully fail and allows the amplifier to work the same under normal listening conditions.

5 • INSTALLATION METHOD AND MAINTENANCE

a) Fixing plate and side handles
HV venti is equipped with a removable fixing plate, positioned beneath the bottom, and with two removable side handles for its displacement.
Before installing the fixing plate, you have to remove it by loosening the four screws, two at each end; on the plate itself you'll find pre-drilled holes and slots to mount the amplifier to the installation site.
After this operation, take the amplifier by its handles and attach it on its pre-installed mounting plate. This operation is easy thanks to the plate runners. Now secure the amplifier by fastening the four screws previously removed into the mounting plate.
Once you have mounted the amplifier, in order to adjust the controls and connect the cables, you have to remove the two fixing handles: beneath them you can make all the necessary adjustments and tighten the connecting cables.
Once handles are removed, access to the electronics is not possible in order to avoid any possible installation bits that could fall inside of it.
When installation is completed, before placing the handles back, you have to mount them to the factory provided grilles, which protect the displacement slot and cover cables.
The ideal installation of the HV venti is when the amplifier is partially embedded, so that the underneath mounting plate is hidden and only the cosmetically appealing one are visible; this is the best choice both in terms of aesthetics and thermal dissipation.

b) Glass panel
The glass panel is removable to enable you to change the setting of the Dual Power system (factory default is Hi Current), or if you want to change Dual Bias configuration (factory default is Low). You have to remove the glass panel also if you want to insert the optional crossover. Please be very careful while removing the glass panel. Also make sure no metallic objects are left inside the amplifier before the glass is re-installed.

c) Maintenance
Since forced cooling systems draw dust, you have to pay special attention to maintenance.
For this reason the metallic grilles that protect the five fans are attached with a magnetic system and are easily removable.
Underneath three of these metallic grilles, you will find a foam filter, which stops the dust from the drawn air. Foam filters have to be periodically cleaned with soap and water; we recommend you clean them once every 6 months or less depending on environmental conditions.
Once filters are dried, they can be put back to their place. Do not use an external heat source to dry the foam filters. Now you can remount the grilles. You can fix them in four different ways according to which Audison logo side you want to be visible.
The cooling ducts can be cleaned as well thanks to the two panels that are accessible beneath the HV venti amplifier. In order to carry out this operation, you have to remove the amplifier.
This is a time consuming procedure so we recommend you to do it every time the amplifier has to be removed for whatever reason.

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1 TECHNICAL DATA — TECHNICAL AND ELECTRICAL FEATURES

ELECTRICAL FEATURES

POWER SUPPLY

Voltage: ..... 11 ÷ 16 VDC
Remote IN: ..... 7 ÷ 16 VDC - 1mA
Idling current when off: ..... 0.006 mA
Minimum idling current
• Low BIAS: ..... *(Hi Current)* 4.2 A ..... *(Hi Power)* 5.6 A
• High BIAS: ..... *(Hi Current)* 6.5 A ..... *(Hi Power)* 10.4 A
Consumption @ 13.8 VDC (Max. musical power): .... *(Hi Current - 1 ohm)* 90 A ..... *(Hi Power - 2 ohms)* 100 A

AMPLIFIER STAGE

Distortion - THD (1 kHz): ..... <0.05%
Distortion - IMD (IHF; 90% of max. power): ..... <0.05%
Bandwidth (-3dB): ..... 4Hz ÷ 75kHz
Damping factor (1 kHz, 4 ohms): 80
Slew Rate: ..... >20 Volts/μs
S/N ratio (A weighed @ 1V): ..... *(PRE ON)* 103 dB ..... *(PRE OFF)* 108 dB
Input Sensitivity
• SENSITIVITY switch on High: ..... *(PRE ON)* 0.25 ÷ 1.5 VRMS ..... *(PRE OFF)* 1.4 VRMS
• SENSITIVITY switch on Low: ..... *(PRE ON)* 1.0 ÷ 6.0 VRMS ..... *(PRE OFF)* 1.4 VRMS
Input impedance: ..... *(PRE ON)* 15 kohms ..... *(PRE OFF)* 100 kohms
Load impedance:
• Stereo ..... *(Hi Current)* 4 - 2 - 1 ohms ..... *(Hi Power)* 4 - 2 ohms
• Mono ..... *(Hi Current)* 4 - 2 ohms ..... *(Hi Power)* 4 ohms

Output power (RMS) @ 13.8V (THD 1%)

Load (Dual Power):	**Hi Current**	**Hi Power**
2 ch into 4 ohms	200 W + 200 W	400 W + 400 W
2 ch into 2 ohms	400 W + 400 W	800 W + 800 W
2 ch into 1 ohm	650 W + 650 W	/
mono into 4 ohms	800 W	1600 W
mono into 2 ohms	1300 W	/

INPUTS AND FILTERS

Pre In: ..... L/R (ABS connectors)
Pre Out (Pre In bypass): ..... L/R (ABS connectors)
Crossover frequencies (factory optional module): ..... 12dB stereo Hi pass and Lo pass
(45 - 55 - 65 - 80 Hz)
24dB mono Lo pass
(45 - 55 - 65 - 80 Hz)

TECHNICAL FEATURES

MAIN FEATURES

Built-in fuses:
Main fuse (strip fuse) ..... 100 A
For Hi Current configuration fuses are built-in (blade mini-fuses) ..... 4 x 15 A
For Hi Power configuration fuses are supplied (blade mini-fuses) ..... 4 x 10 A

Controls:
Inputs (IN MODE) - *PRE ON/OFF* ..... Balanced / Unbalanced
Output (OUT MODE) - *PRE ON/OFF* ..... Mono / Stereo
L / R Alignment - *PRE ON* ..... +3dB Right / +3dB Left
Sensitivity Ranges - *PRE ON* ..... High / Low
Sensitivity Control - *PRE ON* ..... High range: 0.25 ÷ 1.5 VRMS / Low range: 1.0 ÷ 6.0 VRMS

More features:
• Dual power configurations: Hi Power / Hi Current check
• Cooling system progressive start-up and speed control (every channel)
• Optimum listening temperature indicator
• Left and right VUmeter
• Left and right peak distortion indicators

Protection:
• Power limiting circuit in case of overload or speakers short circuit
• Thermal (90°C / 194°F)
• Cooling fans failure
• Short circuit between cables, speakers and chassis
• Battery power supply lower than 11V or higher than 16V
• Direct current in the output

Size:
Height ..... 8.5 cm (3.35 inches)
Width ..... 28.0 cm (11.02 inches)
Length ..... 51.0 cm (20.07 inches)
Weight ..... 15 Kg (32.20 lb)

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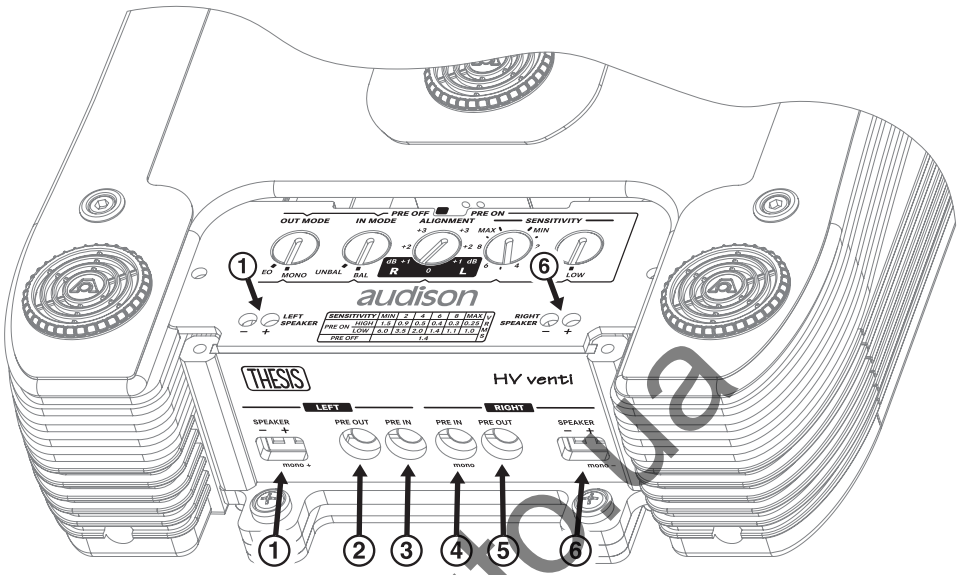

1 • LEFT SPEAKER
Amplifier left channel (Left) power ouput. Connect speakers cables to this output according to indicated polarity. If you use the amplifier in MONO configuration, take positive output from **+ Left** terminal block.

2 • LEFT PRE OUT (ABS connector)
Left channel (Left) preamplified output to send to another amplifier. The signal in this output is the LEFT PRE IN input one.

3 • LEFT PRE IN (ABS connector)
Amplifier left channel (Left) input. The left preamplified output of the source or of an external electronic crossover must be connected to it.

4 • RIGHT PRE IN (ABS connector)
Amplifier right channel (Right) input. The right preamplified output of the source or of an external electronic crossover must be connected to it.
If you use the amplifier in MONO configuration, the signal must be connected to this input.

5 • RIGHT PRE OUT (ABS connector)
Right channel (Right) preamplified output to send to another amplifier. The signal in this output is the RIGHT PRE IN input one.

6 • RIGHT SPEAKER
Amplifier right channel (Right) power output. Connect speakers cables to this output according to indicated polarity. If you use the amplifier in MONO configuration, take negative output from **+ Right** terminal block.

Remark: ABS (Audison Balanced System) connector. If you want to use balanced lines, you need to employ the special extension with ABS connector which you can find in AUDISON CONNECTION catalogue.

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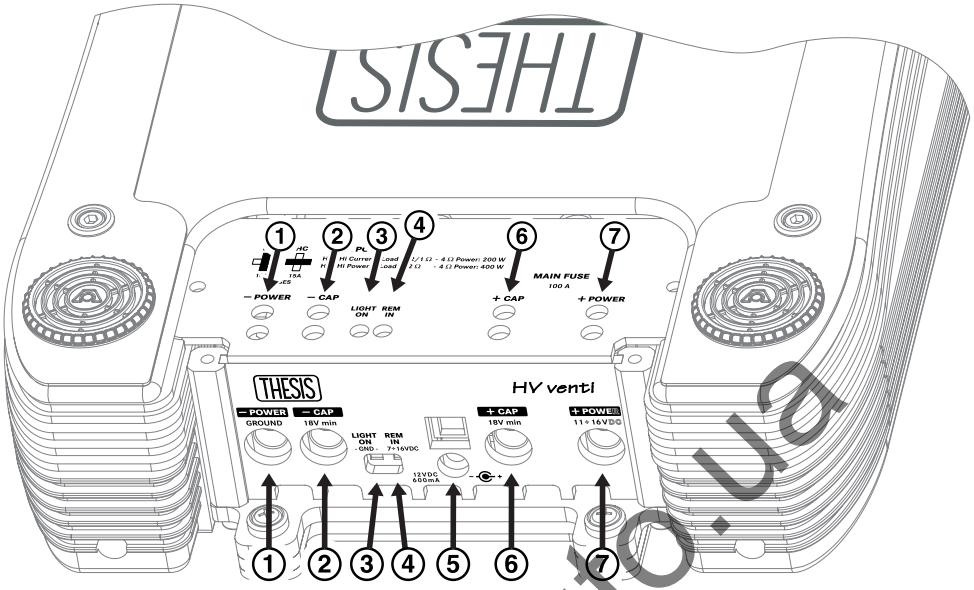

1 • - POWER (GROUND)
Terminal block for the amplifier power supply negative pole connection. Connect the battery negative cable or the one connected to the vehicle chassis to it. Holes have 9.5 mm (.37 inches) diameter and accept cables up to 2 A.W.G. For better current transfer, power supply cables have to be as big as possible.

2 • - CAP (18V min)
Terminal block for connecting the negative terminal of a possible external capacitor. The capacitor working voltage must be 18 Volts min.

3 • LIGHT ON - GND -
Terminal block for amplifier internal light. Connect it to the car chassis to lighten the product. You can remotely control the lighting system through a switch or you can connect the terminal block to the ground switch which activates light in the trunk.

4 • REM IN (7 ÷ 16VDC)
Terminal block for connecting the Remote cable which comes from the source and controls the amplifier switching on. Applied voltage must be between 7 and 16 VDC.

5 • 12VDC 600mA
DC connector for a 600mA, 12V external power supply which switches on the amplifier internal light, including the Status Controller, activated in demo configuration. This function is only cosmetical; LIGHT ON – GND – terminal block doesn't need to be connected to the chassis.

6 • + CAP (18V min)
Terminal block for connecting the positive terminal of a possible external capacitor. The capacitor working voltage must be 18 Volts min.

7 • + POWER (11 ÷ 16VDC)
Terminal block for the amplifier power supply positive pole connection. Connect the car battery positive cable to it. Holes have 9.5 mm (.37 inches) diameter and accept cables up to 2 A.W.G. For better current transfer, power supply cables have to be as big as possible.

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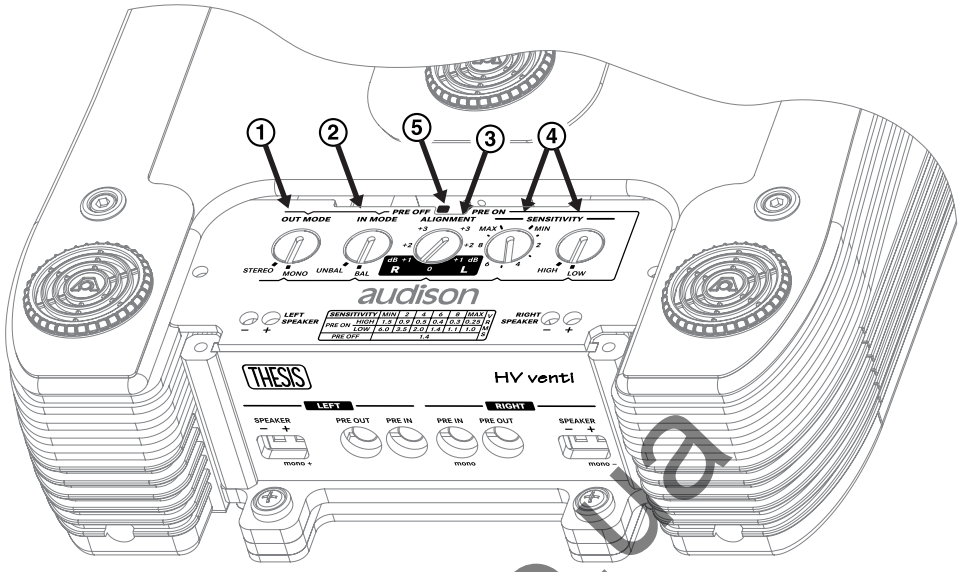

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1 • OUT MODE

It permits to configure the amplifier in **STEREO** or **MONO**.
If you put **Out Mode** control on **STEREO**, PRE IN LEFT and RIGHT inputs signals are separately amplified and they are in SPEAKER LEFT and RIGHT outputs.
If you put **Out Mode** control on **MONO**, you shift phase in the Right channel and you can thus bridge the device. This shifting is necessary since HV venti channels are in phase because of their perfect symmetry, differently from most amplifiers, one channel of which is always out of phase.
Input signal must be applied to **PRE IN RIGHT**.
If installed, the crossover works as 24dB Lo Pass in MONO configuration.
Speakers cables for bridged connection (MONO) must be connected to the **positive** terminals of **SPEAKER** terminal blocks of every channel.
Left and Right channels in STEREO and always one in phase with the other insure excellent, high end performances but don't allow the amplifier Tri Mode configuration. This might occur only when using inputs in balanced configuration and when shifting the positive hot pole with the negative pole of one input. In this case, the speaker positive pole must be connected to the positive output of the channel which is not out of phase.

2 • IN MODE

It selects inputs balanced or unbalanced configuration.
If **IN MODE** control is on **UNBAL**, **PRE IN LEFT** and **RIGHT** inputs are compatible with standard RCA unbalanced preamplified outputs, which various signal sources like CD players, signal processors, etc., are provided with.
If IN MODE control is on BAL, PRE IN LEFT and RIGHT inputs are balanced. Inputs must be connected to a proper balanced signal source in this configuration.

3 • L/R ALIGNMENT

This control increases L or R channels level up to +3dB. It is useful to acoustically align the two channels.

4 • SENSITIVITY

Amplifier input sensitivity controls.
The **HIGH/LOW** control permits to choose the two ranges to calibrate through **MAX/MIN** switch:
If it is set on **HIGH** – input sensitivity can be adjusted between 0.25 and 1.5 VRMS (**MAX/MIN**);
If it is set on **LOW** – input sensitivity can be adjusted between 1.0 and 6.0 VRMS (**MAX/MIN**).
Use **HIGH** range only if you don't have a suitable acoustic signal source to take the amplifier to its max. power.

5 • PRE ON - PRE OFF

It enables (ON) or disables (OFF) the internal pre-amplifier, so that you can drive the amplifier with an external pre-amplifier. Controls are bypassed, except for IN MODE and OUT MODE. The white leds will light only the knobs of these two controls.

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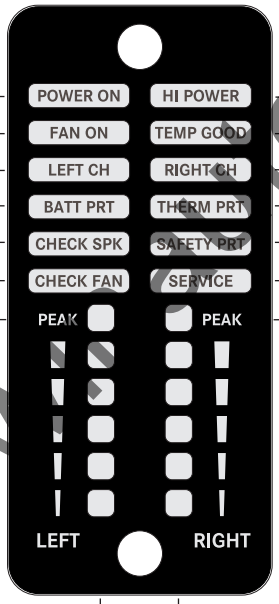
ASC – Amplifier Status Controller Unit

ASC handles all the amplifier functions, except sound.
It has a microprocessor and through its Status Display, it permits to visualise working functions and possible anomalies both of the amplifier and of the whole system. It drives VUmeter for output power visualisation, it controls protection and adjusts the temperature of various parts by controlling fans activation and speed.



POWER ON (green)
The amplifier is on.

FAN ON (green)
It indicates that cooling system is working.

LEFT CH (orange)
It shows left fans speed (4 speeds).
Fixed: minimum speed.
Flashing: intermittence indicates the fans speed.

BATT PRT (red)
Protection activates if power supply voltage is lower than 11V or higher than 16V.

CHECK SPK (red)
Short circuit between an output and the car chassis. Check speakers and cables.

CHECK FAN (red)
One of the four fans of the side heat sinks or the driver central fan has stopped. Check fans and air ducts.

LEFT PEAK – RIGHT PEAK (orange)
It detects the amplifier distortion. It is generally on when VUmeter is completely on and shows maximum power instantaneous attainment. It can occasionally switch on; if it switches on more often and persistently, you need to decrease power. If it switches on when VUmeter is not completely on, it indicates anomalous distortion; applied load may have some problems or impedance may be too low.

HI POWER (green)
Dual Power is in **Hi Power** configuration.
If it is off, configuration is **Hi Current**.

TEMP GOOD (green)
Flashing: wait for the best listening conditions.
Always on: optimum listening temperature.

RIGHT CH (orange)
It shows right fans speed (4 speeds).
Fixed: minimum speed.
Flashing: intermittence indicates the fans speed.

THERM PRT (red)
It indicates thermal protection intervention at 90°C (194°F).

SAFETY PRT (red)
It indicates the intervention of any protection. In order to find the cause of the problem, check the following indicators: LEFT CH, RIGHT CH; BATT PRT; THERM PRT; CHECK SPK.

SERVICE (red)
The amplifier is broken; contact a service centre.

VUmeter LEFT-RIGHT (green)
It shows there is signal on LEFT and RIGHT outputs. It starts to work at intermediate power levels.

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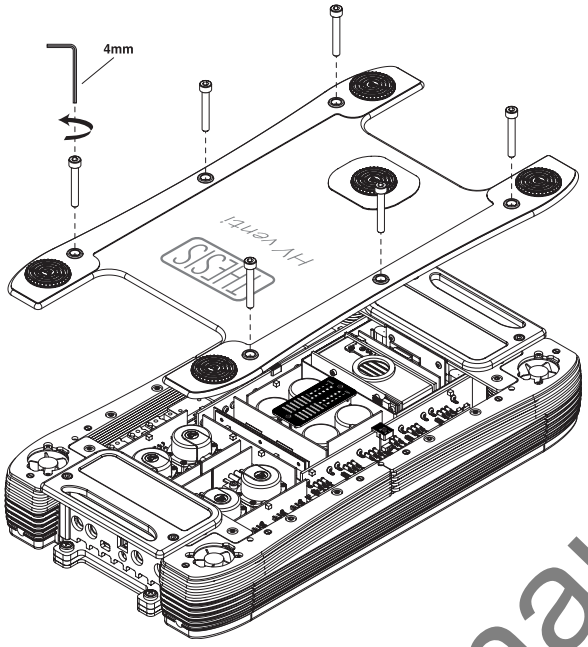
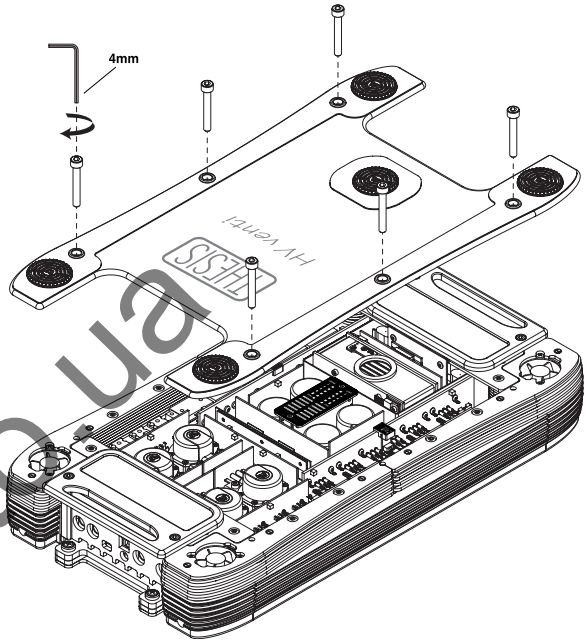
THESIS

5 OWNER'S MANUAL — GLASS PANEL REMOVAL

a. Unscrew the 6 screws which fix the glass panel



b. Before closing the product, make sure there are no objects inside. Put the glass panel back.
Fasten the 6 closing screws.



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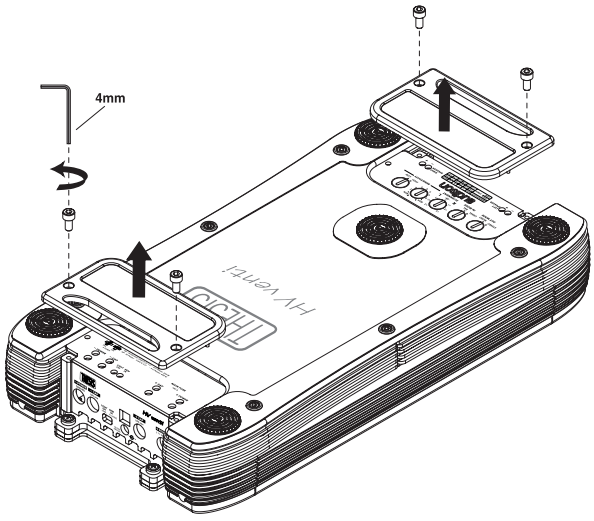
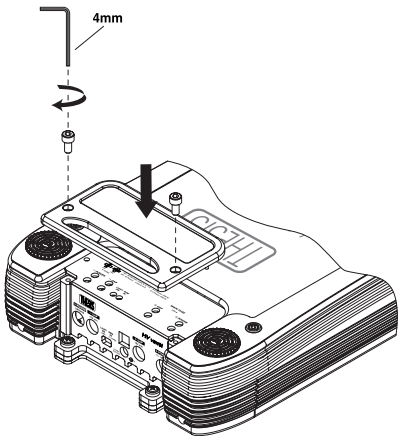
Caution!: Panel is made of very sturdy, tempered glass but we suggest you avoid any bumps against hard objects. Handle with care. In case it breaks, it will generate countless little pieces which are not harmful for your hands. Contact Audison service centres in order to replace it.
Don't open the panel when the amplifier is on.
Before removing the panel, disconnect the fuse next to the battery, along the positive power supply cable.

6 OWNER'S MANUAL — SIDE HANDLES REMOVAL

a. Unscrew the 2 screws which fix the side handle



b. Mount the side handles back, by fastening the proper screws.



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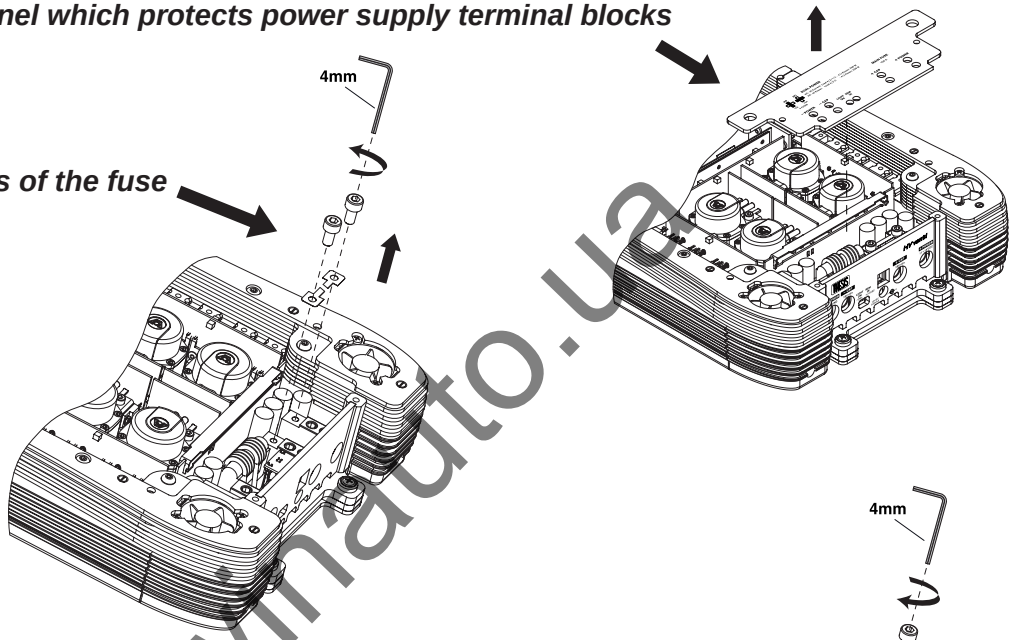
7 OWNER'S MANUAL — MAIN FUSE REPLACEMENT

a. Remove the glass panel: see ➡ 5 OWNER'S MANUAL — GLASS PANEL REMOVAL

b. Remove the side handle above power supply terminal blocks: see ➡ 6 OWNER'S MANUAL — SIDE HANDLES REMOVAL

c. Lift the plexiglass panel which protects power supply terminal blocks



d. Remove the two parts of the fuse to be replaced

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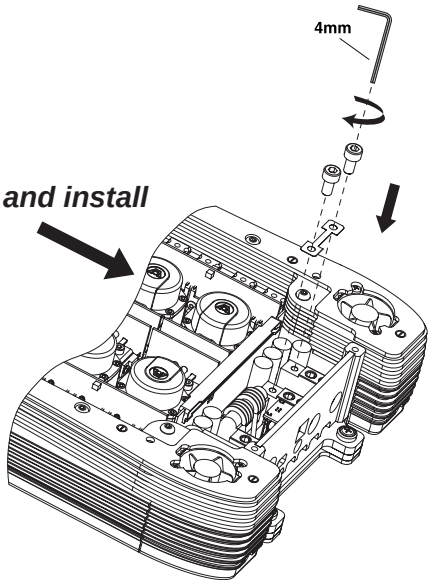
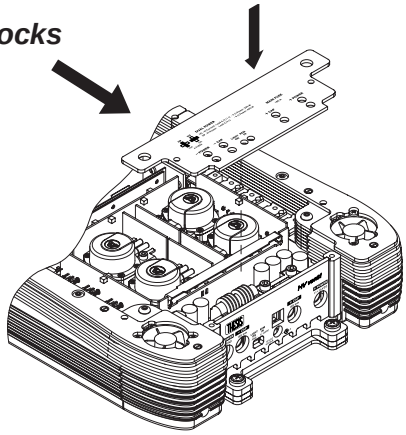
e. Eliminate all possible metallic remainders of the broken fuse and install the new one



f. Mount power supply terminal blocks protecting panel



g. Mount the side handle back: see ➡ 6 OWNER'S MANUAL — SIDE HANDLES REMOVAL

h. Reassemble the glass panel: see ➡ 5 OWNER'S MANUAL — GLASS PANEL REMOVAL

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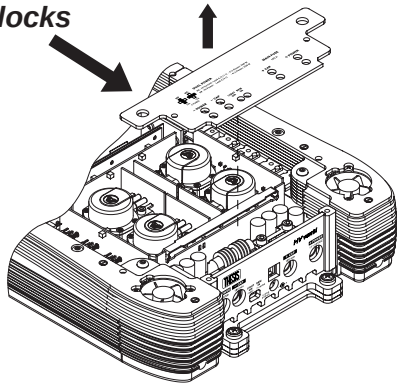
THESIS

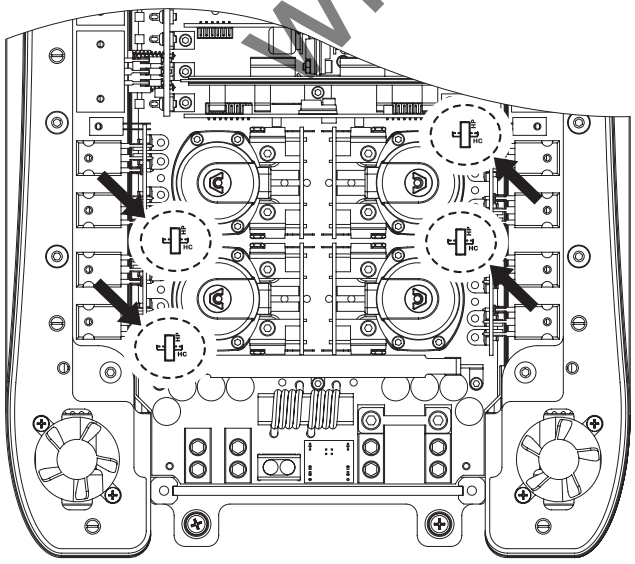
a. Remove the glass panel: see ➡ 5 OWNER'S MANUAL GLASS PANEL REMOVAL

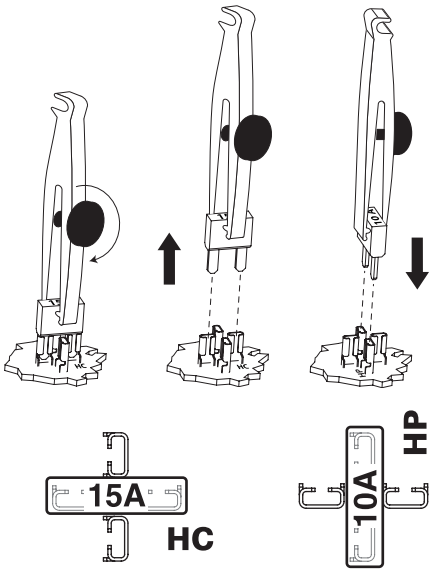
b. Remove the side handle above power supply terminal blocks:
see ➡ 6 OWNER'S MANUAL SIDE HANDLES REMOVAL

c. Lift the plexiglass panel which protects power supply terminal blocks



d. Find the 4 blade mini-fuses and set them in the configuration you like. Before closing the product, make sure all 4 have been installed in the right position





Caution!: If the amplifier has been connected and switched on, in order to change Dual Power, besides turning the amplifier off and following setting you need to wait for **2 minutes** before replacing the mini-fuses and to carefully follow the instructions for the glass panel removal. We suggest you use the insulated pliers supplied with the device in order to prevent the amplifier from being damaged by short circuits caused by the capacitors charge.
When setting the fuses, the thermal sensor wire connectors which are near them might get pulled off. Make sure the connectors are properly inserted.

Pre-setting

HI CURRENT
4 15A blade mini-fuses

HI POWER
4 10A blade mini-fuses

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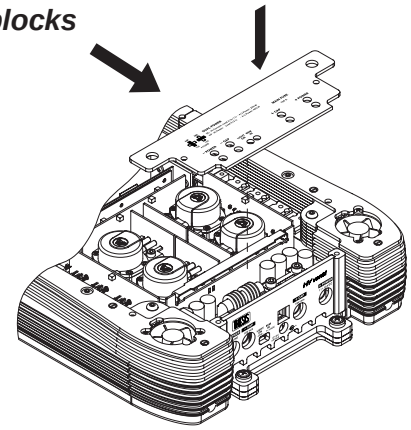
8 OWNER'S MANUAL — DUAL POWER CONFIGURATION

e. Mount power supply terminal blocks protecting panel



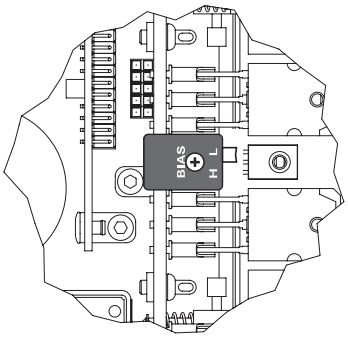
f. Mount the side handle back: see ➡ 6 OWNER'S MANUAL — SIDE HANDLES REMOVAL

g. Reassemble the glass panel: see ➡ 5 OWNER'S MANUAL — GLASS PANEL REMOVAL

9 OWNER'S MANUAL — DUAL BIAS CONFIGURATION

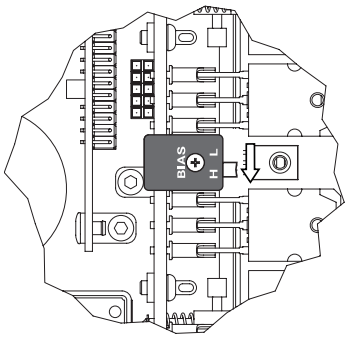
a. Remove the glass panel: see ➡ 5 OWNER'S MANUAL — GLASS PANEL CONFIGURATION

b. Set BIAS switch on L (LOW – pre-setting) or on H (HIGH)



Pre-setting

BIAS ➞ L



BIAS ➞ H

Caution!: if you change BIAS switch setting, idling current when off (without signal) varies as follows:

Dual Power	BIAS	Current (A)
Hi Current	L	4.2
Hi Current	H	6.5
Hi Power	L	5.6
Hi Power	H	10.4

c. Reassemble the glass panel: see ➡ 5 OWNER'S MANUAL — GLASS PANEL REMOVAL

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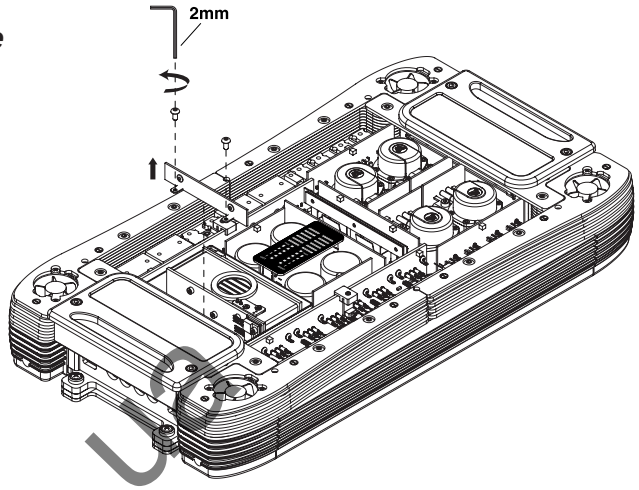
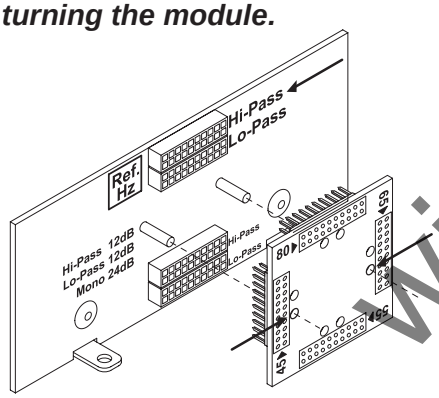
a. Remove the glass panel: see ➡ 5 OWNER'S MANUAL GLASS PANEL REMOVAL

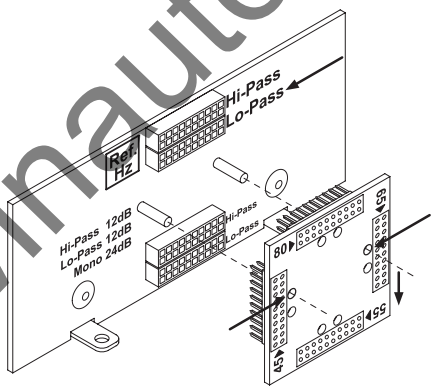
b. Remove the bypass module by unfastening the two screws which secure it inside the product.



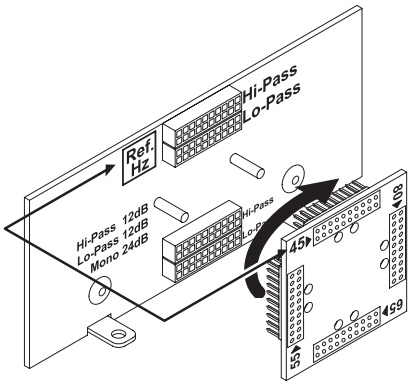
c. Select the filter and the frequency you like by moving connectors upwards or downwards and turning the module.



HI PASS
12dB - 45 / 55 / 65 / 80 Hz

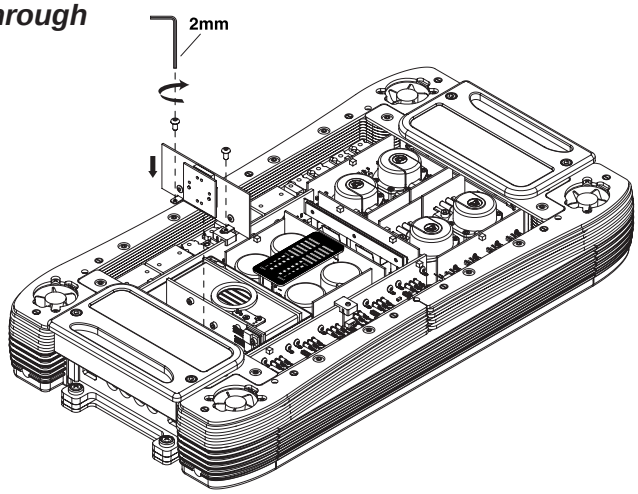


LO PASS
12dB - 45 / 55 / 65 / 80 Hz (STEREO)
24dB - 45 / 55 / 65 / 80 Hz (MONO)



FREQUENCIES REFERENCE

d. Install the pre-set crossover module and fix it through the two special screws



e. Reassemble the glass panel: see ➡ 5 OWNER'S MANUAL GLASS PANEL REMOVAL

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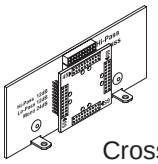
a. Accessories supplied with HV venti

Audison sticker

INOX "CARD"
Certificate of property with HV venti serial number



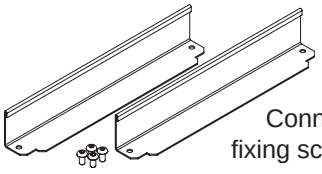
Crossover module

Insulated pliers to remove mini-fuses

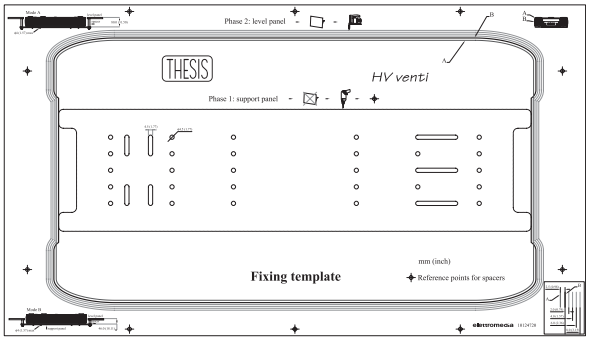
10A blade mini-fuses

100A strip fuse

2mm and 4mm spanners



Connections covering grilles and fixing screws



Caution!: the adhesive drilling template is under the amplifier inner carton.

Adhesive drilling template

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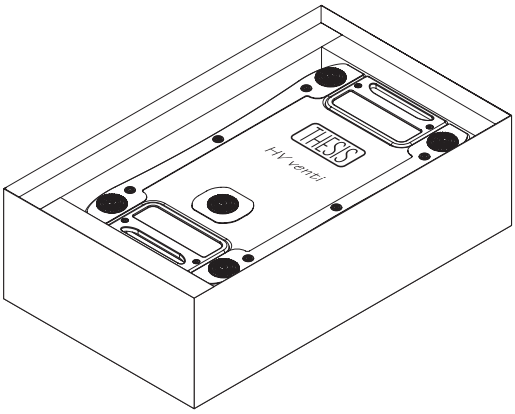
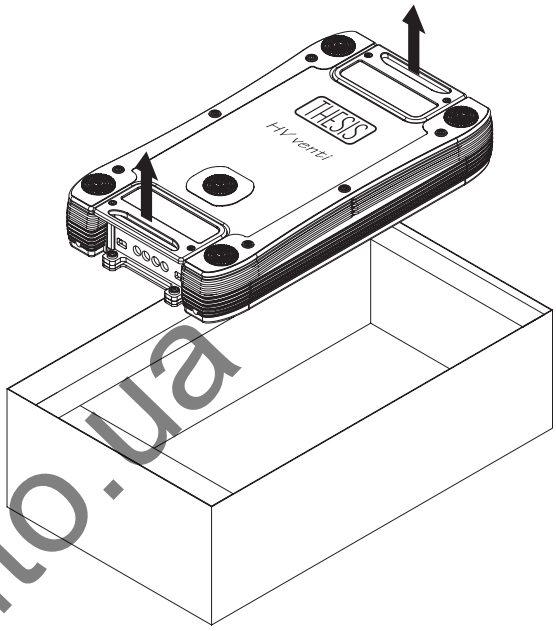
b. How to take the amplifier out of its inner carton



Take the amplifier out of its inner carton using the side handles.



Caution!: the adhesive drilling template is under the amplifier inner carton.

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c. If you like to change DUAL POWER configuration in order to set it on "HI POWER":

see ➡ 8 OWNER'S MANUAL DUAL POWER CONFIGURATION

d. If you like to change DUAL BIAS configuration in order to set it on "H":

see ➡ 9 OWNER'S MANUAL DUAL BIAS CONFIGURATION

e. If you like to install the electronic CROSSOVER:

see ➡ 10 OWNER'S MANUAL CROSSOVER INSTALLATION

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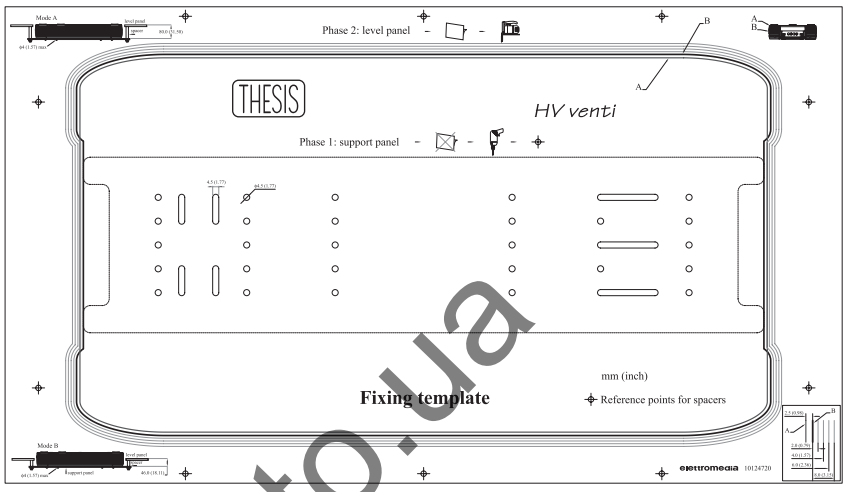
f. NON-PROJECTING or SEMI-PROJECTING installation

HOW TO USE THE ADHESIVE DRILLING TEMPLATE

The drilling template is useful for NON-PROJECTING or SEMI-PROJECTING installation.
It is not necessary if installations totally project from the surface.
It has two functions:
1) It permits to drill the fixing panel (support panel) to secure the fixing plate.
2) It permits to exactly cut the upper panel (level panel) in order to embed the amplifier.



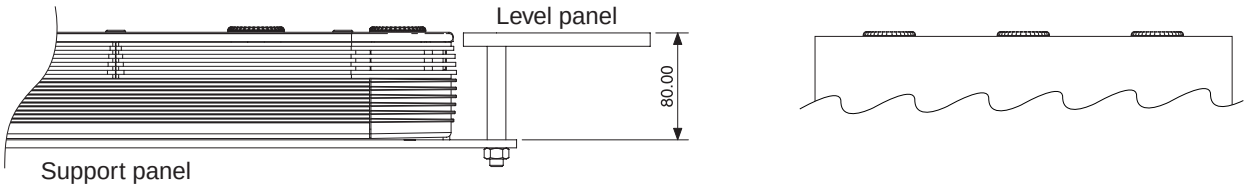
PROCEDURE

PHASE 1
1) Put the fixing template onto the fixing panel (support panel) without removing the adhesive protection
2) Drill the fixing panel (support panel) where indicated, including the areas where to put the spacers.

PHASE 2
1) Remove the adhesive protection.
2) Apply it on the upper wooden panel (level panel).
3) Use a hacksaw to cut along the indicated pattern, according to the type of fixing you like.
4) Drill the holes for the spacers fixing.

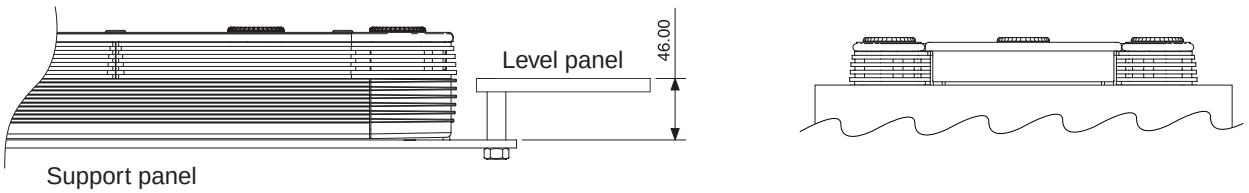
Caution!:
There are several thin marks on the template, which you can use if you like to cover the cut edge. Use the most suitable mark to the thickness of the material you choose for the covering.
Use suitably thick wooden spacers (20mm min.) all along the structure.

NON-PROJECTING FIXING



SEMI-PROJECTING FIXING

Recommended for better thermal dissipation



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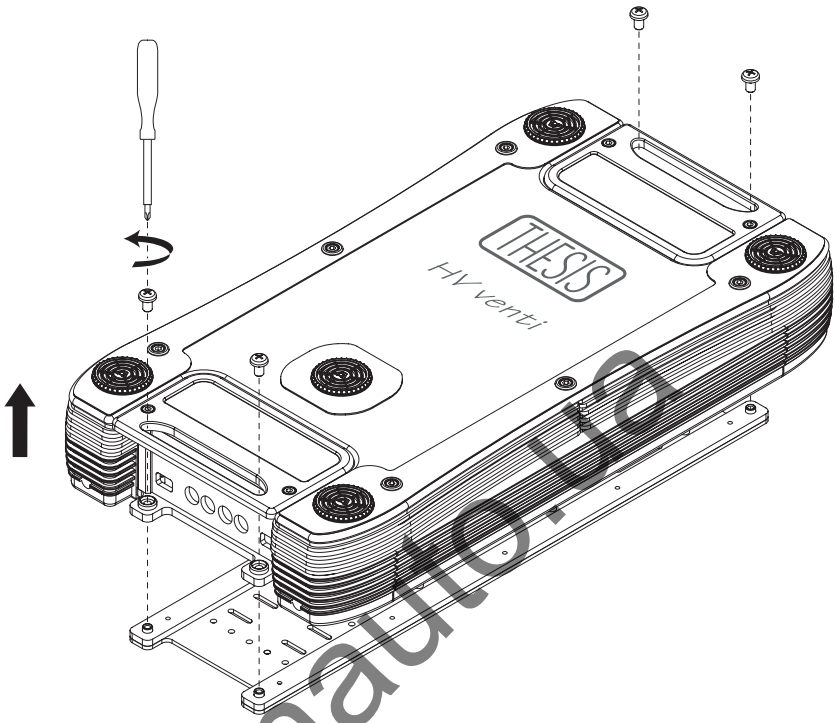
g. Remove the amplifier fixing plate



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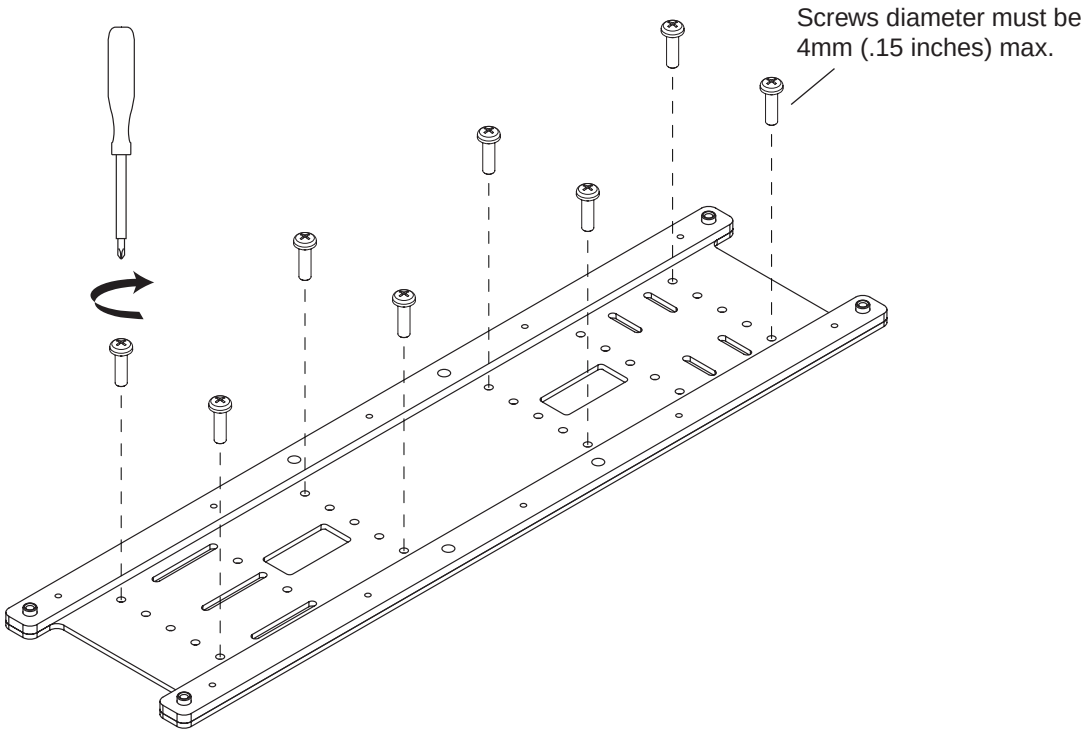
h. Secure the fixing plate through 8 screws at least



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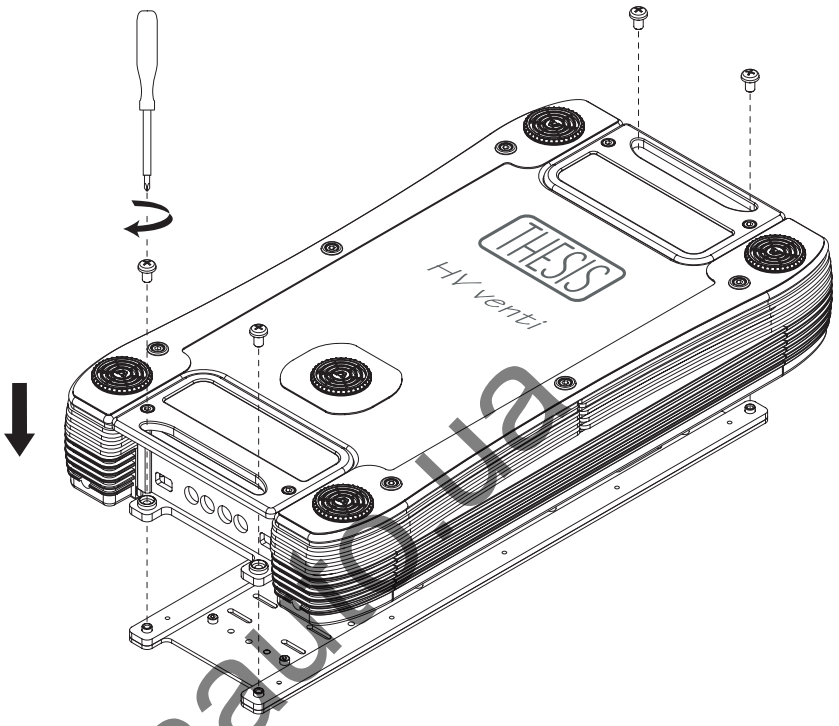
i. Secure the amplifier to the fixing plate



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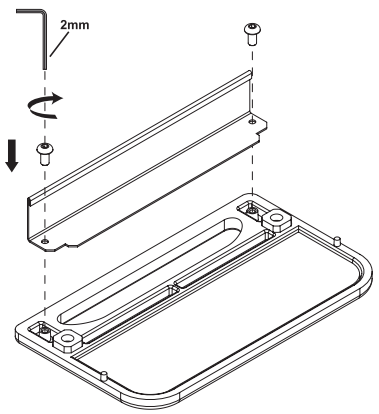
j. Connect signal cables: see 1 OWNER'S MANUAL INPUTS - OUTPUTS PANEL

k. Connect power supply cables: see 2 OWNER'S MANUAL POWER SUPPLY PANEL

l. Amplifier calibration: see 3 OWNER'S MANUAL CONTROLS PANEL

m. Mount the grilles which cover connections onto side handles



n. Reassemble both side handles, including grilles, on the amplifier:

see 6 OWNER'S MANUAL SIDE HANDLES REMOVAL

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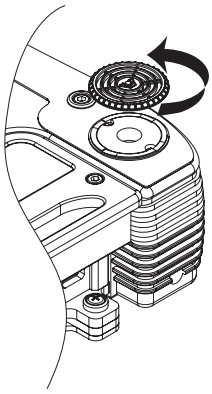
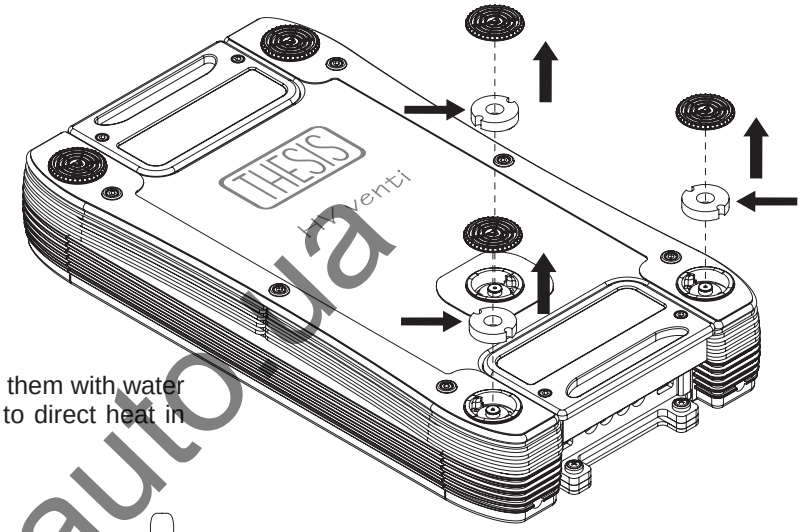
a. Fans protecting filters cleaning

This operation has to occur every six months approx.

1 • Remove the magnetic grilles which protect fans.



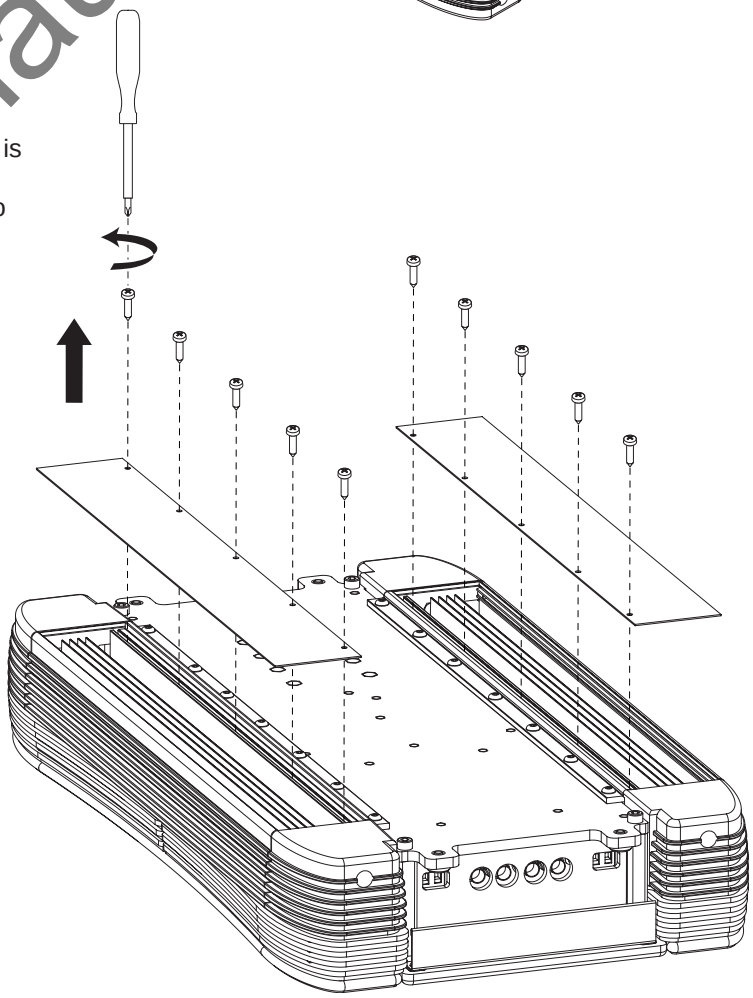


2 • Remove the three foam filters and clean them with water and soap. Filters must not be exposed to direct heat in order to be dried.
Put filters back in their location.

3 • Put the grilles back in their locations.

b. Cooling ducts cleaning

This is recommended every time the amplifier is removed from its fixing plate.
In order to clean cooling ducts, you need to remove the panels which protect them.



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